



## XDR (extensively drug resistant) and PDR (pandrug resistant) Gram-negative bacilli: an extreme model of resistance

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Matthew Falagas

Alfa Institute of Biomedical Sciences, Greece

The advanced antimicrobial resistance of Gram-negative bacilli (mainly *A. baumannii*, *Pseudomonas aeruginosa*, and extended spectrum beta-lactamase producing Enterobacteriaceae, including *Klebsiella pneumoniae*) has become a global public health threat. The intrinsic or acquired antimicrobial resistance in these clinically important pathogens is mediated with various mechanisms (production of beta-lactamases and/or enzymes inactivating aminoglycosides, efflux pumps, lower permeability of the outer membrane, mutations in antibiotic targets, etc.). Broad-spectrum beta-lactam antibiotics have been considered the first choice for the treatment of patients with multiple drug resistant *A. baumannii* and *Pseudomonas aeruginosa* infections. However, the worrisome pattern of increasing antimicrobial resistance of these pathogens has led to re-evaluation and use of intravenous and aerosolized polymyxins (mainly colistin) in various parts of the world. In addition, various agents with novel mechanisms of antibacterial action have been investigated, although there are no available clinical data regarding their effectiveness and safety. Also, the developments in the advancing pattern of antimicrobial resistance of Gram-negative bacilli has been associated with the use of a diversity of definitions of multiple drug resistant (MDR), extensively drug resistant (XDR), and pandrug resistant (PDR) pathogens on which we have commented (Falagas ME et al. *Clin Microbiol Infect* 2005;11:1049, *J Med Microbiol* 2006;55:1619, and *Clin Infect Dis* 2008;46:1121). Considering various issues, the terms “pandrug resistance”, “extensive drug resistance”, and “multidrug resistance” should designate resistance of a pathogen to all, resistance to all but 1 or 2, and resistance to at least three, respectively, classes of antimicrobial agents, among those that are available at the time of use of the definition in most parts of the world and are regarded as potentially effective against the respective pathogen.